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156/244.24

CA 0971051
JUL 1975

(11) (A) No 971051

(45) ISSUED July 15, 1975

(52) CLASS 117-67
C.R. CL. 18-23.40
32-31

(19) (A) # CANADIAN PATENT

(54) ## APPARATUS FOR MAKING A FLEXIBLE CLOSURE

NOGU/ H7560W/31 ★CA -971-051

Appts. for joining plastic strips to film to form reclosable bag - has preheat and heated joining rollers and uses localised cooling

NOGUCHI T 07.09.71-US-178086 (26.12.70-JA-118723)

Q31 (15.07.75) B65b-00/*

The mechanism is for attaching strips such as those having an interlocking profile thereon to a laminated sheet of plastic. The sheet is preheated by passing it over a heated roller and then passed over a heated joining roll having a nip formed with a pressure roll and feeding a freshly extruded hot strip into the nip and onto the sheet and thereafter applying localized cooling after the strip. Preferably, the strip is cooled independently of the sheet after the joining zone, this being accomplished by two sequential coolers which direct a flow of cooling fluid at sequential positions on the strip. 24.12.71 as 131156 (14 pp).

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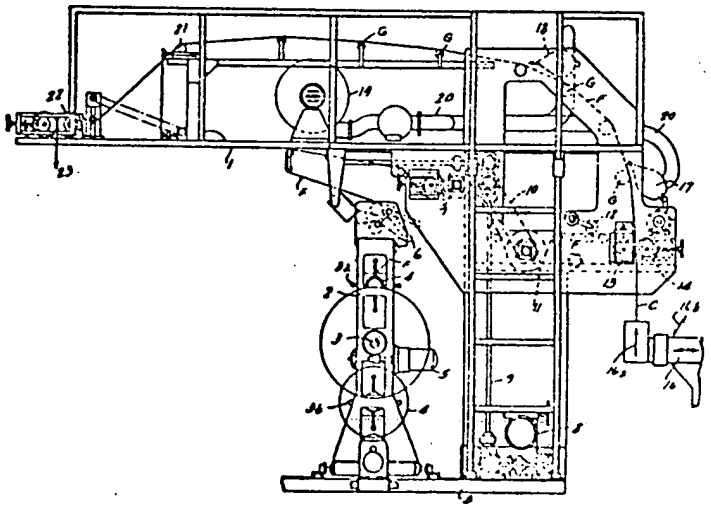

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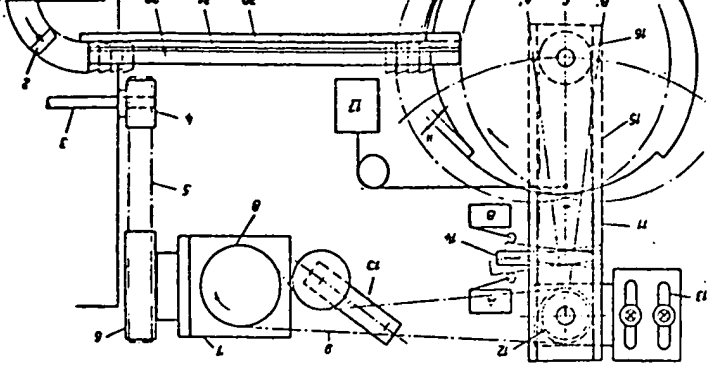

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The mechanism is for use with packing machines, separating flat prismatic items, preferably on edge, from a cohesive incoming row, the items being delivered irregularly to a passage with guide walls, at the end of which they are separately removed by a wheel with notches cut into it. The wheel is mounted on a lever swinging on an axis above or below its own, so that its centre describes an arc. This arc lies in a plane passing through the passage centre line and at right angles to its base, and the wheel can be brought to bear against the end of the row of items. In its two end positions the lever can actuate feelers dependent on whether items have accumulated in the passage, or are absent from it. In the former eventuality the feed of items into the passage is halted, and in the latter the wheel is stopped. 15.1.75 as 501267. (8 pp)

(19) (A)

(54) SAPA H821BW/31 *DT 2501-267
Prismatic item separator mechanism from row - has notched separator wheel on lever swinging towards row end
SAPAL 18.01.74.CH.000720
Q31 (24.07.75) B65b-61/08

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(21) APPLICATION No. 131, 156
(22) FILED Dec. 24, 1971

(30) PRIORITY DATE Dec. 26, 1970 (45/118723) Japan
Sep. 7, 1971 (178, 086) U. S. A.

No. OF CLAIMS 18

(2)

This invention relates to a method and apparatus to join plastic strips of various interlocking fastener means to laminated film continuously and automatically so as to produce therefrom reclosable bags made from said laminated film and fastener strips attached thereto. Conventional reclosable plastic bags featuring various types of plastic fasteners have hereto been used as one of the necessities of modern living because they are, as indicated, reclosable and also very convenient. However, the above mentioned conventional plastic fastener bag consists of a simple combination of fastener means and bag bodies, both of which are formed integrally and at the same time of a single plastic or resin material, for example, polyethylene or polypropylene, because of the requirements of the manufacturing method.

Such reclosable bags formed of a single material are suitably used for the purpose of getting their contents in and out or preserving them therein, but since their material is made from a single sheet and is not absolutely airtight, their use as bags for such goods as medicines or foods, the quality of which might be affected by air or moisture, is not appropriate.

Therefore, in the case of packaging goods where it is necessary to protect their quality, it is desirable that bag bodies be formed of more air impervious laminate films, which may be formed of a lamination of cellophane and/or paper and/or aluminum, etc. together with a resin film such as polyethylene or other plastic. It is nearly impossible in view of the existing production equipment and its operation to produce laminated films and fastener means by the method of extruding both the laminated film and the fastener means at the same time, as in the manufacturing of reclosable bags formed of a single material. Further, the method of laminating another different film on the already formed fastener film also is not desirable because when both are attached together the pressure added thereon by the heating and pressure rolls causes changes in the structural form of the fastener means to take place. (Therefore, the method of joining fastener means on to laminated film formed separately, is the most appropriate, in which case there are two methods of proceeding: These are: the use of a binding agent or the method of joining by fusion through heating.) The method of joining fastener strips, which

same or by perforating it with a cutter 12 stationed between the above mentioned heating roll 11 and the joining roll 13. Below the joining roll 13 an extruder 16 that is movable back and forth against the surface of said roll, is provided, and fastener strips C are extruded therefrom and joined with film F passing over said joining roll 13 at said joining roll. Thus, the film F is fused with the fastener strips by the joining roll 13 and is then transported over several guide rolls G provided in the machine body 1 to a winding station where it is wound up.

Further, while being transported over the guide rolls G, the portion of the film F that joins the fastener C is strongly cooled by cool air blown out of cooling devices 17 and 18 located near the joining roll. The said cool air is supplied to cooling devices 17 and 18 through a duct 20 from air conditioning equipment 19 provided in the machine body 1.

The drawing also shows a handle 15 which moves a press roll 14, a roll 21 that controls the course by which film F is transferred, and a take-up roll 22. Next, the operation of the above mentioned structure is explained as follows:

The above film having been pulled out of the apparatus 2 used for unwinding a roll of film, is heated before it is combined with the fastener strip C by a joining roll 13. In the case where both the film and the fastener strips are made from the same resin material, it is not necessary that both of them are heated by the heating roll 11 because both of them can be perfectly fused and combined with each other by simultaneous extrusion.

But, in the case of laminated film it is impossible, as mentioned previously to extrude integrally at the same time both the film and the fastener strips. When the fastener strips are fused and combined continuously with the already formed laminated film, which is in cooled condition, since it was formed long before, the film must be reheated to the desired temperature by a heating roll 11, as the said film has lost a temperature suitable for fusing and this must now be delivered to it. However, when the above mentioned film F is heated an effective method of handling the film material is required. For example, in order to produce economically, it is necessary

surface of the film adjacent the web of the fastener C.

In order to prevent such a situation, it is necessary to cool both the fastener and the film at different rates so as to provide more cooling to one than to the other. Therefore, according to this invention the following cooling equipment is provided:

Partial cooling is carried out, that is to say, cool air is blown only against the fastener strips C and their web portions by cooling equipment 17 and 18. Accordingly, only the portions of film F where the fastener webs are attached are cooled as they move over the guide rolls G and are thereby kept at almost the same temperature as the other adjacent thin portion of the film against which no fastener heat is applied. Thus, it is possible to prevent shrink marks and wrinkles from being created on the film. Thus, also, according to the method and apparatus for this invention, it is now possible to fuse and combine fastener strips, etc. with laminated films continuously, automatically and at high speeds, and to mass produce and supply inexpensive reclosable good quality plastic bags made from different laminate barrier films having a greater range of protection for the products contained therein, though this was not technically feasible heretofore. Further, since the main structure of this apparatus consists of a mechanism which includes in specific combinations a heating roll, a heated joining roll, special cooling equipment and a special method of moving the extrusion equipment, economical production of laminated reclosable bags is now possible. Since the preheating necessary to fuse and combine fasteners to laminated film can now be suitably given to film, the said apparatus is applicable to all kinds of laminate films. In addition, the above mentioned special cooling prevents the film to which the fastener is attached from abnormally shrinking or wrinkling. These are the features of this invention.

Figure 2 illustrates a sheet 30 of the type made by the mechanism above described. This is a sheet which can be doubled at its center, or in other words, folded over on itself, and seamed along the edges to form a bag with an open bottom 36. The profile strips are located so that when the bag is doubled over, they are within the bag, as shown in Figure 3. Also attached

to the sheet 30 are reinforcing strips 32 and 33 which have aligned ribs extending therealong, and these ribs will guide the tear formed in the bag when the top is torn off. In order to use the bag, the top will be torn off to leave flanges so that the interlocking rib and groove elements may be pulled apart.

The film sheet 30 may be formed of thin plastic or may be a lamination having several layers. For example, the inner layer 30a may be of thin plastic film and the outer layer 30b may be of foil or paper or other material which provides stiffness or other properties to the bag. While the example of Figures 2 and 3 illustrates a sheet with profile strips 31 and 34 and also reinforcing strips 32 and 33, it will be understood that the mechanism of Figure 1 may be utilized to apply various types of strips, such as profile strips alone.

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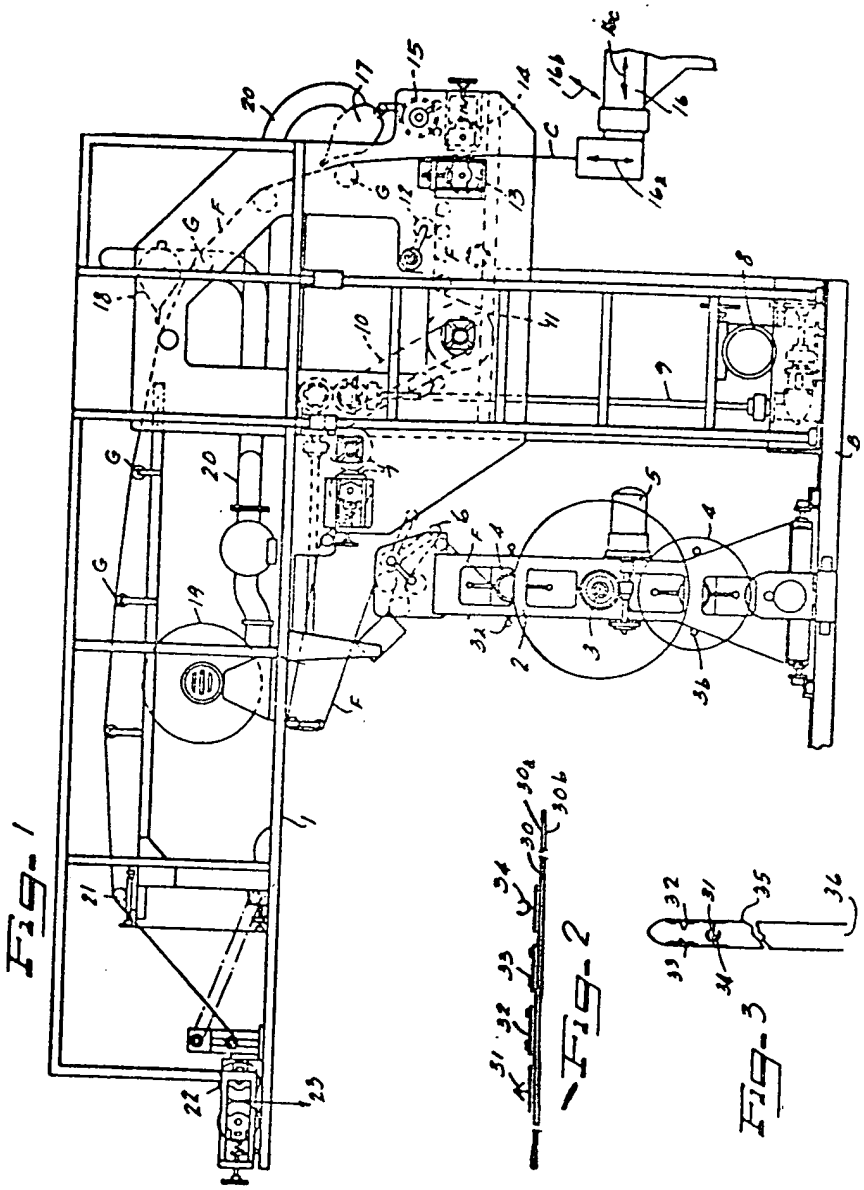

Fig. 1

Fig. 2

Fig. 3